REMARKS

This responds to the Final Office Action mailed on November 20, 2009.

Claims 22-36 are amended, and no claims are cancelled or added; as a result, claims 22-36 remain pending in this application.

Drawing Rejections/Objections

The drawings were objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims.

Applicant has demonstrated above that the elements of the invention are reflected in the drawings as they stand, most particularly in Figure 3 and as described in the accompanying text.

The Rejection of Claims Under § 101

Claims 22-36 were rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention.

Applicant has amended these claims, based on the machine or transformation test as currently understood. More specifically, the methods described are now limited to transformation of a digitized audio track as described in paragraph 27, the method implemented on a computerized system as shown in Figure 1 and the accompanying description.

The Rejection of Claims Under § 112

Claims 22-29 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

Claims 30-36 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

As noted, paragraph 36 recites evaluating loudness values for a number of frames that make up the audio track. The limitation in question is more clearly supported by paragraph 46 (not previously cited), which recites performing statistical analysis on loudness of a randomly chosen sample of frames from the audio track, using as an example 500 randomly chosen frames as statistically representative of the frame loudness distribution of the audio track. The description of paragraph 46 therefore succinctly illustrates selection of some or all frames of an

audio track in a manner such that the frames are statistically representative of the entire track, along with a discussion of how it might be implemented and the benefits of doing so.

The Rejection of Claims Under § 103

Claims 22-36 were rejected under 35 U.S.C. 103(a) as being unpatentable over Silfvast et al. (U.S. 5,524,060) in view of Kuhn et al. (U.S. 6,414,960).

Silfvast describes visual representation of a gain control system for an audio instrument. The cited Figure 10 illustrates a visual representation of the current state of the dynamic input level at 177, a transfer function applied to the input signal as shown at 169-173, and the resulting signal output level at 179. More specifically, the transfer function has unity gain regions 169 and 170, a sharp gate 171, and a compressed region 173, such as are employed in musical instrument effects (see, col. 14, ln. 41-62).

It is significant that Silfvast does not receive or process a complete audio track, but instead receives and processes a continuous audio signal from a musical instrument being played. Sampling frames from an audio signal representative of the entire track and adjusting the loudness of the entire track is therefore impossible in the context of Silfvast.

In contrast, the pending claim 22 and its dependents recite a system in which an audio track is evaluated to determine the loudness distribution of frames in the track, which is not done in Silfvast. Further, an apparent loudness weighting is applied to the frames, emphasizing the relatively greater effect that louder frames have on perceived loudness in determining a loudness of the track, while no perceived track loudness determination or weighting of loud frames in determining such a perceived loudness is made in Silfvast. Also, the audio track as recited in the pending claims is adjusted based on the determined apparent loudness of the track and a desired apparent track loudness, while no track loudness or desired apparent track loudness concepts are present anywhere in Silfvast.

Kuhn describes a system and method for testing synchronization between audio and video. It recites in the cited figs. 10-12 and accompanying text an audio/video sync test measurement system operable to look for audio and video markers in an audio/video stream. It nowhere describes determining the loudness of a plurality of frames in an audio track to determine the loudness distribution of frames across an entire audio track, but simply looks for

audio/video markers and indicates if they are in synchronization over a brief period anticipated to be three seconds or less (see col. 9, ln. 50-52).

Kuhn also fails to consider any other element of the pending claims not found in Silvfast, including determining an apparent loudness weighting for the audio frames emphasizing the relatively greater effect that louder frames have on loudness perception, and adjusting the loudness of the track based on the determined loudness levels and apparent loudness weighting of the plurality of frames so that the apparent loudness of the track matches a desired apparent loudness.

Applicant reserves the right to address that the references solve different problems using different methods, and that elements cannot be piecemeal assembled irrespective of the function or structure of the underlying reference should any rejection be maintained.

Because neither of the cited Silvfast and Kuhn references teach several elements of the pending claim 22 and its dependents, including evaluating an audio track to determine the loudness levels frames in the audio track such that the loudness levels of the frames are representative of the loudness distribution across the entire audio track, determining an apparent loudness weighting for the audio frames emphasizing the relatively greater effect that louder frames have on loudness perception, and adjusting the loudness of the track based on the determined loudness levels and apparent loudness weighting of the plurality of frames so that the apparent loudness of the track matches a desired apparent loudness, the pending claims are patentably distinct from the cited art. Reexamination and allowance of pending claim 22 and its dependents is therefore respectfully requested.

With respect to claim 30 and its dependents, the claims each again recite operating on a an entire audio track based on loudness of frame samples taken from the track, distinguishing the claims from Silvfast's musical instrument loudness gate and Kuhn's synchronization tester as described above in greater detail.

Claim 30 further recites calculating a dynamic spread of the audio track, and determining a non-linear compressor transfer function configured to produce a desired dynamic spread having greater dynamic range compression at high loudness levels that at low loudness levels. Claim 30

and its dependents then apply the determined non-linear compressor transfer function to the audio track to produce an audio track with the desired dynamic spread.

Silvfast nowhere discusses a desired dynamic spread, or determining a non-linear compressor transfer function configured to produce a desired dynamic spread having greater dynamic range compression at high loudness levels that at low loudness levels. Such a function would again be impossible in Silvfast, as it does not have the ability to sample an audio track and then adjust the audio track based on loudness samples taken from across the audio track.

Although Figure 7C of Silvfast illustrates a transfer function having a linear region and a compression region, such a transfer function is not derived from audio frame loudness samples or designed to produce a desired dynamic spread as is recited in the pending claims. Silvfast also fails to consider applying such a determined non-linear compressor transfer function to the audio track to produce an audio track with the desired dynamic spread, as is recited in the pending claims.

Kuhn again describes no features of the pending claim 30 or its dependents, including determining the loudness of a plurality of frames in an audio track to determine the loudness distribution of frames across an entire audio track, but simply looks for audio/video markers and indicates if they are in synchronization over a brief period anticipated to be three seconds or less. Because the cited references fail to anticipate the elements of pending claim 30 and its dependents, including evaluating an audio track to determine the loudness levels of a plurality of frames in the audio track such that the loudness levels of the frames are representative of the loudness distribution across the entire audio track, using the loudness levels of a plurality of frames in the audio track to calculate a dynamic spread of the audio track, determining a non-linear compressor transfer function configured to produce a desired dynamic spread where the transfer function has greater dynamic range compression at high loudness levels that at low loudness levels, and applying the determined non-linear compressor transfer function to the audio track to produce an audio track with the desired dynamic spread, the pending claims are patentably distinct from the prior art. Reexamination and allowance of pending claim 30 and its dependents is therefore respectfully requested.
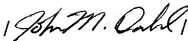
CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's representative at (612) 349-9581 to facilitate prosecution of this application.

If necessary, please charge any additional fees or deficiencies, or credit any overpayments to Deposit Account No. 19-0743.

Respectfully submitted,

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402--0938
(612) 349-9581

Date January 20, 2010   By _____
                                          John M. Dahl
                                          Reg. No. 44,639

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 20th day of January 2010.

      Kathryn Grinnell   /Kathryn Grinnell/
Name   Signature